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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/767,798
Filing Date: January 29, 2004
Applicant(s): Murray et al.

Mr. Tarolli

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/10/2008 appealing from the Office action mailed 04/11/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

The amendment after final rejection filed on 07/29/2008 has not been entered.

(4) Status of Amendments After Final

The amendment after final rejection filed on 07/04/2008 has not been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

7268866	Messler	09/2007
6177649	Juret et al.	01/2001
4083223	Hashimoto et al.	04/1978
6585146	Shepard	03/2003
4214164	Traub et al.	07/1980
6299346	Ish-Shalom et al.	10/2001
7044634	Sandvoss	05/2006

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 13-15, 20-21, 25-26, 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messler (U.S. 20040114662/ 7268866) in view of Jaret et al. (U.S. 6177649) [hereinafter Jaret].

Messler discloses in Figs. 1, 4-5 a device/ method in the field of applicant's endeavor of positioning two plastic pieces 11 and 12 to abut each other in a weld and applying a laser beam 20 continuously (plurality of times) directed onto the pieces, the plastic piece 12 is absorbent to the laser radiation (therefore, can heat the weld). An inspection radiation device 30, 31, a camera 39 and a pyrometer 58 are used during welding (7268866, as the weld being formed, col. 2, line 67, col. 3, lines 1-2) for testing of the welding process (para [0011]). The piece (second) 11 is transparent to the laser beam; therefore, the location of the abutment of two pieces is being heated by the laser beam 20. Messler also teaching to have a feedback (col. 7, line 9) to a welding apparatus (weld controller) in order to regulate the laser beam intensity/ modifying the

heating if a signal (parameter/ temperature) is too high (outside desired or upper threshold or lower threshold). The device is used for obtaining a thermal data (predetermined wavelength corresponding to the IR) based on the thermal radiation 33 emanating from the weld and detected by the CCD 39 (and the pyrometer 58) of the entire weld in order to determine (parameter/ quality, col. 6, line 6) the integrity/ quality of the weld (col. 5, lines 47-67, col. 6, lines 1-8). It is inherent, that having said image of the entire weld would ensure obtaining temperature at different points of the entire weld. The image(s) is analyzed in the evaluation unit. The pyrometer 58 is used to analyze the thermal radiation emitted by the weld, comparison with a reference, if the deviations are determined; the intensity (heat) of the laser is modified. Mirrors 23, 24 are moved to direct the laser onto the weld.

For claim 13: It is inherent, that the weld should be heated by the laser beam a plurality of time at a plurality of points in order to create a weld having a desired length.

For claim 15: It is inherent that the controller would compare the measured radiation with a threshold or desired radiation in order to determine if there is lack of quality (fails to meet the requirements), as very well known in the art.

For claim 29: the laser beam is reflected by a reflective device (mirrors).

Please note, since the weld is in between the layers, then, according to Fig. 5, the emanating radiating passing through the second layer 11 toward the CCD 39.

For claim 25: Please note, that the laser is constantly directed (plurality of times) onto the weld, and that the modifying of the heating by laser would also take place during that directing.

The method step will be met during the normal operation of the device stated above.

Although the CCD camera receives thermal radiation from the weld, Messler is not clear if the CCD is acting as a thermal camera providing a thermal image. Messler does not explicitly teach that the thermal data provided by the pyrometer is in the form of thermal images.

Jaret discloses a device in the field of applicant's endeavor comprising a camera 6 producing thermal images of the weld during welding.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Messler, so as to have a thermal camera (or replace the pyrometer with the thermal camera, or modify the CCD to enable it to produce thermal images), as taught by Jaret, in order to provide the operator not only with the visual data of the weld, but also with the image of thermal data of the weld, in order to allow the operator to take necessary actions, if one area is heated less than another.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messler and Jaret, as applied to claims 1-4, 13-15, 20-21, 25-26, 29-30 above, and further in view of Hashimoto.

Messler and Jaret disclose the device/ method as stated above.

They do not explicitly teach an alarm.

Hashimoto discloses in Fig. 1 a method/ device for monitoring quality of a weld comprising heating the weld and immediately (substantially simultaneously) acquiring a

thermal distribution signal on another side of a second piece (col. 2, lines 25-33). The device also has a feedback control for analyzing the data and determining if the data meets an associated criterion and modifying the heating/ cooling and providing a warning signal/ alarm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add an alarm, disclosed by Messler and Jaret, so as to notify the operator about failure and to allow the operator to control defects, lack of integrity of the weld caused by improper welding process/ improper heating by controlling the weld temperature within predetermined (desired/ standard) limits. The method step will be met during the normal operation of the device stated above.

Claims 7, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messler and Jaret, as applied to claims 1-4, 13-15, 20-21, 25-26, 29-30 above, and further in view of Schepard(U.S. 200201724410).

Messler and Jaret disclose the device/ method as stated above.

They do not explicitly teach the limitations (determining width) of claims 7 and 18.

Schepard discloses a device in the field of applicant's endeavor, the device can be used to determine the size (thus, inherently, width) of the weld and the quality (presence of cracks, voids, defects, discontinuities) of the bond (col. 7, lines 1-2) and, inherently, compare them to the threshold (standard) by means of the histogram.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a feature capable of determining the size of the weld, as taught by Schepard, so as to control the size of the weld, and thus the quality of the weld, because the proper weld size is very important in some miniature applications.

The method step will be met during the normal operation of the device stated above.

Claims 8, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messler, Jaret and Schepard, as applied to claims 7, 18 above, and further in view of Traub.

Messler, Jaret and Schepard disclose the device/ method as stated above.

They do not explicitly the limitations of claims 8 and 19, i.e., determining that a parameter (width) is outside of the threshold.

Traub teaches a device / method in the field of applicant's endeavor wherein, in an automatic mode, a thermal signal (parameter) from a weld is compared to a signal recorded in memory (reference/ threshold), if the signal is higher or lower than the reference (does not meet an associated criterion), welding parameters are being adjusted by a (feedback) control circuitry (weld controller).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the controller of the device, disclosed by Messler, Jaret and Schepard, so as to have a feedback weld controller, as taught by Traub, in order to enable the device not only to detect failure but also to implement corrective functions.

The method step will be met during the normal operation of the device stated above.

Claims 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messler and Jaret, as applied to claims 1-4, 13-15, 20-21, 25-26, 29-30 above, and further in view of Ish-Shalom et al. (U.S. 6299346) [hereinafter Ish-Shalom].

Messler and Jaret disclose the device and method as stated above.

They do not teach the limitations of claims 24 and 28.

Ish-Shalom discloses a device wherein in order to obtaining a correct temperature (thermal data) of a test sample (wafer), IR wavelengths from the heating lamps cut off (filtered).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device, disclosed by Messler and Jaret, so as to cut off the heating radiation from the final thermal data results, as taught by Ish-Shalom, in order to preserve the accuracy of the thermal data, as already suggested by Ish-Shalom.

The method steps will be met during the normal operation of the device stated above.

Claims 5-6, 16-17, 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messler and Jaret, as applied to claims 1-4, 13-15, 20-21, 25-26, 29-30 above, and further in view of Schepard (U.S. 200201724410).

Messler and Jaret disclose the device and method as stated above.

They do not explicitly teach a plurality of images and determining time of taking an image.

Schepard teaches to obtain (plurality) thermal images over time and sample them over time in order to reconstruct the entire image. This would suggest that Schepard determines the time of taking the particular image. It is inherent, that Schepard would not take any images after the full image reconstructed, and there is no need to take more images.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device/ method disclosed by Messler and Jaret, so as to take an image at a time, as taught by Schepard, in order to obtain a time temperature function which would allow the operator to determine heat conductivity/ diffusion of the weld and thus, it's quality, as very well known in the art.
The method step will be met during the normal operation of the device stated above.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messler and Jaret, as applied to claims 1-4, 13-15, 20-21, 25-26, 29-30 above, and further in view of Sandvoss.

Messler and Jaret disclose the device and method as stated above.

They do not explicitly teach the limitations of claim 27.

Sandvoss discloses a device/ method in the field of applicant's endeavor comprising heating a weld with a laser beam. The laser heat can be regulated by intensity, duration or speed of the moving laser beam (col. 3, lines 4-7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the IR thermal data means, disclosed by Messler

and Jaret, so as to regulate heating by varying duration, intensity or the speed of the laser beam, as taught by Sandvoss, so as to provide the operator with an appropriate method of regulating of the heat, as very well known in the art.

The method step will be met during the normal operation of the device stated above.

(10) Response to Argument

For claim 1: Appellant states that in Messler, the inspection radiometer 30 and pyrometer 58 are completely independent in functional sense. Appellant states that Messler does not teach "obtaining a thermal image as a weld being formed by collecting IR passing through a second piece of material from the weld and pool of material". These arguments are not persuasive because, as indicated in the rejection, although Messler uses pyrometers, the thermal radiation is also obtained by the CCD camera 39, as shown in Fig. 5, by collecting radiation from the pool of material and weld, the radiation passing through the second (transparent) piece 11. The fact that the device may operate independently does not mean teaching away from the claimed invention. Appellant states that the radiometer 30 obtains data only from a solidified melt, the radiometer 58 obtains data only from unsolidified melt (no "simultaneously", as claimed by Appellant). This argument is not persuasive because in col. 2, line 65, Messler states that the measures of IR "can be … used not only the welding operation ", this statement would imply that "during (simultaneously) the welding operation" itself is included. Appellant states that Jaret does not cure the deficiencies of Messler. This argument is not persuasive because in the rejection of the merits, the Examiner uses Jaret as a

secondary reference only for its teaching that the thermal radiation from the weld could be provided to the operator in the form of the thermal image.

For claim 3: Appellant states that the combination of Messler and Jaret do not teach that the pool is entirely within the FOV of the IR detector (detecting radiation from the weld and pool). This argument is not persuasive because, according to Fig. 5 of Messler, the entire weld pool is within the FOV of the CCD 39. As far as "detecting radiation from the weld and pool" concerns, although this Appellant's limitation is covered by Fig. 5 of Messler, this limitation is not stated in claim 3. It is the claims that define the claimed invention, and it is claims, not specification that are anticipated or unpatentable. Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1064.

For claim 13: Appellant states that the combination of Messler and Jaret do not suggest directing the laser beam over the path of a weld pool multiple times". Appellant adds that the Examiner interpretation that the continuous mode of the beam could be considered as applying the beam multiple times over a period of time is wrong.

The Examiner respectfully disagrees. Any signal provided continuously over time could be considered as a plurality of point signals over time, unless Appellant defines the laser beam as, for example, a plurality of discrete beams.

Appellant states that the beam 50 of the instant invention is directed over the same points on the path multiple times. This argument is not persuasive because this limitation is not stated in claim 13. It is the claims that define the claimed invention, and it is claims, not specification that are anticipated or unpatentable. Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1064.

For claim 33: Appellant states that Schepard does not teach stopping the obtaining of thermal images of the weld after the weld is formed. That Schepard does not have an "element" to perform this function. Appellant states that "under doctrine of inherency, the element is not expressly disclosed". This argument is not persuasive because Sheppard, inherently, has at least a power button which would be responsible for turning the device on/ off when necessary. In addition, it is a common sense in stopping taking measurements or using the equipment when the operation is completed. For example, one would stop taking the images of the parade when the parade is over. Appellant states that Schepard does not stop taking images after the weld is done. That Schepard only stops when the weld is done and cooled. Even in this interpretation, Schepard does not teach away from the claimed limitation since Schepard stops taking images after the weld done (as claimed by Appellant) and after the weld cooled (an additional feature: in response to Appellant's argument that the reference includes an additional feature not required by Appellant's invention, it must be noted that the reference discloses the invention as claimed. The fact that it discloses additional feature not claimed by Appellant is irrelevant) versus stopping taking images during the weld.

(11) Related Proceeding(s) Appendix

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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